Incorporation of Marine Research and Resource Issues into Public Education

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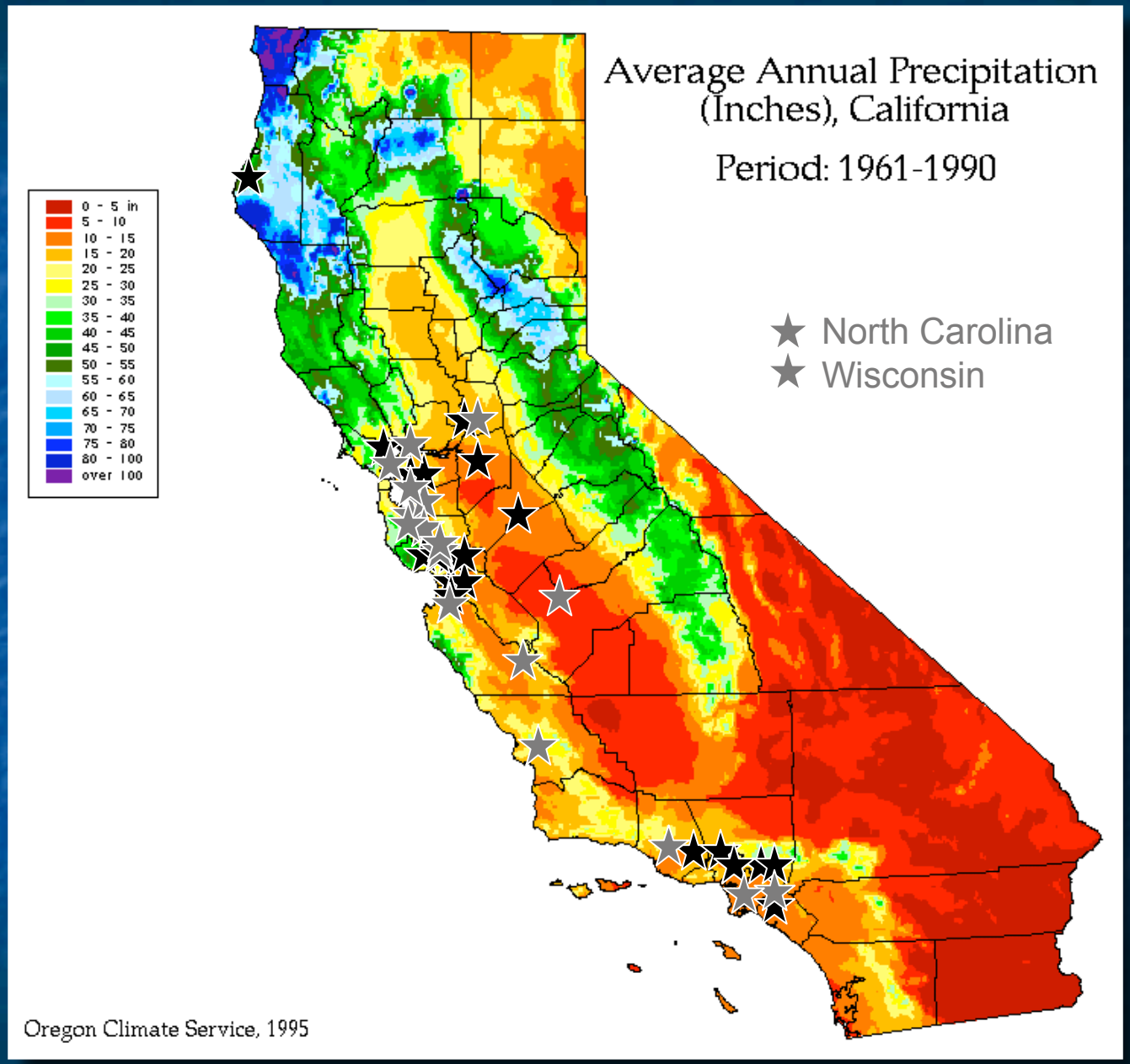
Professional Development for Teachers

Target Audience

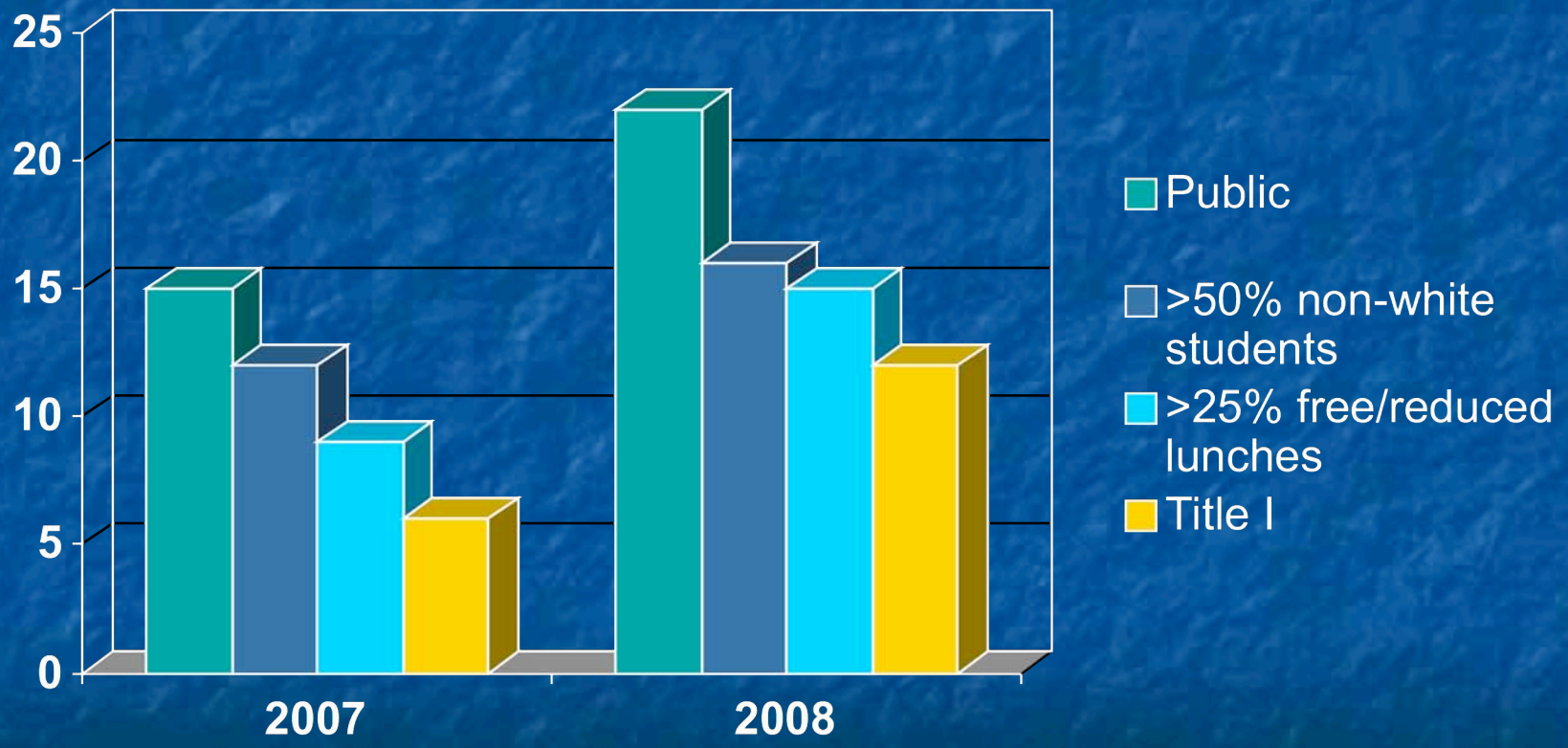
- 20 teachers/year
- Middle and high school science
- 2,500 students
  - 5 classes of 25 students per year (USDE estimate)

☆ 2007

★ 2008


Average Annual Precipitation
(Inches), California
Period: 1961-1990
0 - 5 in
5 - 10
10 - 15
15 - 20
20 - 25
25 - 30
30 - 35
35 - 40
40 - 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 100
over 100
North Carolina
Wisconsin
Oregon Climate Service, 1995

Schools


25
20
15
10
5
0
2007
2008
Public
>50% non-white students
>25% free/reduced lunches
Title I

Program Goal

- Teachers will demonstrate increased understanding of how marine research provides data for developing effective marine resource management techniques, especially as they relate to the Monterey Bay watersheds.

- Eight Program Objectives

Project Overview

- Summer workshop
- Curriculum
  - field, lab, and computer activities
  - using real and current data
  - addressing current issues
  - targeting CA science standards

Project Overview

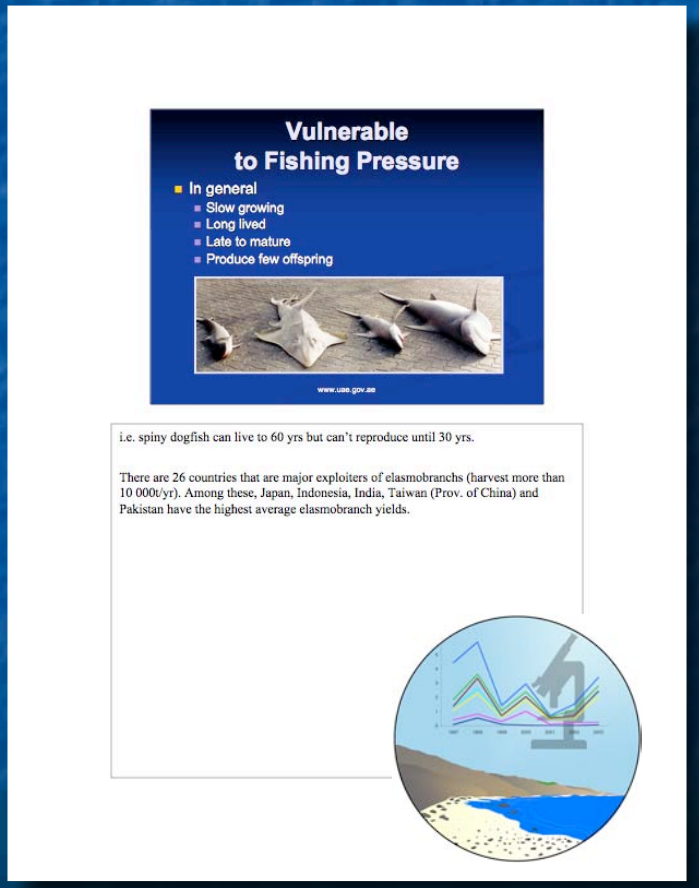
- Academic year support
- To local classrooms
  - Scientists
  - Teacher helpers
  - Stuff
- To the field
  - Local experts

Evaluation Plan

- The evaluation plan for this project will be three fold:
  - Front-end
    - used to determine audience needs, skills, and knowledge
  - Formative
    - used to improve the project
  - Summative
    - used to guide judgments about the project's impact and merit

Products

- Workshop: “Field and Lab Explorations in Marine Science”
- Logo
- Website
  - teach.mlml.calstate.edu/
- Curriculum
  - Distributed to workshop participants on CD



Curriculum

- Watershed Overview
  - MLML
  - ESNERR
  - MERITO (MBNMS)
- Habitat Monitoring
  - LiMPETS (MBNMS)
    - Sandcrab activity
  - Salinas River State Beach
- Scientific Database use
  - SIMoN (MBNMS)
- Virtual Sea Urchin
  - Hopkins Marine Station

MLML Curriculum

- Invasive Species
  - MLML Research
    - Japanese mud snail (*Batillaria attramentaria*)
  - Kirby Park, Elkhorn Slough

MLML Curriculum

- Habitat Restoration and Water Quality
  - MLML Research
    - Nitrate levels
  - Moro Cojo Slough

MLML Curriculum

- Shark and Ray Monitoring and Conservation
  - MLML Research
    - Prickly Shark (*Echinorhinus cookei*)
  - Monterey Bay Aquarium

MONTEREY BAY AQUARIUM®

Evaluation Results

- All goals were met, teachers reported:
- Gaining new lesson plans & hands-on activities
- Incorporating hands-on field and lab activities into their curriculum
- An enhanced understanding of how research data are collected and used in resource management and protection of the marine environment
- Satisfaction with the forum of peer support established during the workshop

Changes Made

- Provide teachers with access or low cost alternatives to equipment/technology needed to teach workshop content
- Provide more time for math and graphing activities
- Implement student surveys

Thank you for your time